EVALUATION OF HEALTH MANAGEMENT INFORMATION SYSTEM: A STUDY OF RAJASTHAN STATE

A SYNOPSIS

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1. INTRODUCTION

1.1 Variate Structure

Health Management Information system(HMIS) is a process of collecting , processing, and reporting the relevant information to healthcare providers and managers for effective and efficient planning and service delivery. It is one of the critical element of managing various public health program, in an integrated fashion under the department of health.

Properly organized , implemented and used HMIS can alone contribute very significantly to improve program delivery and thus the outcome. Thus accurate relevant and up-to-date information is essential for health service providers/managers at all level so that they can initiate action on the gaps in the system based on evidence and information. Therefore maintaining a good HMIS is an essential part of running a public health system. [1]

Recognizing the importance of Health in the process of economic and social development and improving the quality of life of our citizens, the Government of India has resolved to launch the National Rural Health Mission (NRHM) to carry out necessary architectural correction in the basic health care delivery system. The National Rural Health Mission (NRHM) was set up in 2005 with the objective of providing effective, efficient and accountable health care programs to the rural population in the country with special attention being focused on those states of the country that have either weak public health indicators or weak infrastructure or both[15].

To enable capturing of public health data from both public and private institutions in rural and urban areas across the country, The NRHM-HMIS (Health Management Information System) web portal was launched by the Ministry of Health and Family Welfare (MoHFW) on 21 st October, 2008.[27]

The portal is envisaged as a "Single Window" for all public health data for the Ministry of Health and Family Welfare. The MoHFW initially rolled out the HMIS up to the District Level and now being expanded to the Sub District/Block level facility wise data entry. Over 630 Districts are reporting their monthly performance on a regular basis.

The System has been developed with the following aims:

- To enable the data entry at Facility, Sub District, District, State & National Levels.
- To enable user to preview, compare, modify and forward data to the next level.
- The data stored by using the Data Entry Application would be transformed and loaded into data marts which will be used for Statistics, Analytical & Ad hoc reporting.

- To consolidate the data entered at facility, sub district level/block, district level, at the state level and further at national level and store it into the central database.

There are various challenges in the HMIS. Some of them are related to data aggregation which leads to delay in the flow of information which affects planning and management of programs, absence of a robust feedback mechanism (state to district and district to health centers), huge amount of time required in report preparation, lack of confidence in sending the information through internet. The data quality, timely collection and utilization are other major concerns.[11]

The MoHFW web portal is used only by district level for uploading of data. For operationalizing web portal from block level and catering to local customization, in Rajasthan state HEALING (Health Information System for Government) is in use. Where data is being uploaded from block PHC (where computer facility and internet connectivity is provided). The overall report of the district is generated here by the districts and then uploaded on the MoHFW website.[28-29]

Where management is weak data will not be used to plan, to control or to evaluate services. The starting point of any health information system development at the primary health care level should therefore be the strengthening of the managerial function. Managers should be able to formulate questions to be addressed by the health information system, should grasp the information presented to them and should use it to plan, evaluate and control the health services. As long as this does not occur, the HMIS remains as a mere data based system. [6]

In the context of IT-based systems and solutions in healthcare, Evaluation is the act of measuring or exploring properties of a health information system (in planning, development, implementation, or operation), the result of which informs a decision to be made concerning that system in a specific context [7].

Evaluation has no justification in itself, - it has to have a purpose. evaluation is , screening for options, obstacles and barriers, diagnosing problems within a vast of observations, prognosing risks, while monitoring success and failure factors. Subsequent to evaluation, it is the responsibility of the project management and its team members to treat identified obstacles and symptoms of failure by adapting and refining the trail of activities within the plan pursued, with respect to content, emphasis and/or approach.[8]

One may identify an infinite number of evaluation activities during planning, development, implementation, or operation of a health information application. As system development and implementation activities of for instance an electronic healthcare record are utterly complex and virtually in-deterministic, so are the evaluation activities to be employed. A substantial number of evaluation methods exist [9], but are not appropriately known to its target users [7].

Since a properly organized Health Management Information System (HMIS) is needed to provide timely, relevant and quality information required by the Health Ministry to manage its programmes and activities, the development of an effective health management information system is therefore greatly improve the efficiency of health services delivery at all levels.

1.2 Rationale

The magnitude of the NRHM agenda and the concomitant interventions require that accurate, timely, reliable and relevant information is made available to policy makers, programme planners, managers and implementers so that quick and corrective measures may be taken by them for keeping the programmes on course.

Various frameworks to assess the Health Information System are having their own set of activities and thus limitations.

Therefore, it is prudent to develop a framework for evaluation of state HMIS and undertake an extensive exercise to review the generation of different data at different levels in the present HMIS, identify the challenges in the present system and correlate the same with the existing and proposed system with a view to streamline the capturing and reporting of data from the standpoints of adequacy, usefulness and operational feasibility.

1.3 Objectives

Broad Objectives:

- To study the existing Health Management Information System(HMIS) in Rajasthan prevailing at various level of public health system.
- To develop a framework for evaluation of HMIS system
- To find out the strengths and weaknesses of existing HMIS system.
- To prepare recommendations for enhancement in existing HMIS system.

Specific Objectives:

- Study of manual HMIS system at primary level.
- Study of computerized HMIS at various level(Block PHC, CHC, District , State level)
- Study of various tools for evaluation of HMIS.
- To identify the loopholes regarding manual HMIS in the state
- To identify the loopholes in computerized HMIS in the state.
- To find out the perception about the HMIS among officers working at different level.

2. REVIEW OF LITERATURE

The following section discusses various studies that have dealt with study of health management information system (HMIS)and various evaluation frameworks.

Literature suggests that, there have been very few examples globally where a computerized HMIS has been operational in a population based health care delivery system for a significant duration [1-3]. In evaluation of a Health Management information system in Uganda, based on interviews with doctors and nurses, the authors concluded that introduction of HMIS resulted in health workers valuing the data generated by them better; it supported program planning and decision making as well as improved the quality of and access to health care [4-5]. Many of the evaluations have also looked at the utility of HMIS as a tool to assist organizational development [9].

Different Frameworks for HMIS evaluation:

Technical perspective: To ensure that technology supports business needs and that IT investments deliver the desired value, an Information System Architecture (ISA) is used to defined and its accurateness to the business model and existing technologies are measured.

in the paper [17] scholar concern on evaluating ISA by measuring its qualities (relevant at enterprise level). The paper provided an overview on the software evaluation approaches, qualities and metrics and theirs relevance for the enterprise information system architecture evaluation and the health-care case study supported these findings.

Lifecycle perspective : Brender has viewed evaluation in a lifecycle perspective which is a hypothetical model. According to the scholar, evaluation may include screening for options, obstacles and barriers, diagnosing problems within a vast of observations, prognosing risks, while monitoring success indicators and failure factors. Evaluation is the act of measuring properties and characteristics of an object of study. Thus, it is obvious that evaluation activities may address one or many of the entire spectrum of independent variables within a system development or implementation project, from the conception of an idea till the completion of the system's purpose[8].

PRISM framework: Anand et al (2010) have evaluated computerized HMIS for primary healthcare in rural india .The evaluation framework was adapted from the Performance of Routine Information System Management (PRISM) framework which uses a systems framework of inputs (technical, organizational and behavioral factors), processes, outputs, outcomes and impact[18].

Performance of Routine Information System Management (PRISM), a conceptual framework developed by MEASURE Evaluation and John Snow, Inc., acknowledges the broader context in which Routine health information systems (RHIS) operate. It emphasizes strengthening RHIS performance through better data quality and improved information use.

PRISM includes three key categories of determinants: 1) Behavioral 2) Technical 3) Organizational

Behavioral determinants includes the knowledge, skills, attitudes, values, and motivation of the people who collect and use data; Technical determinants includes data collection forms, processes, systems, and methods; and Organizational determinants comprises of information culture, structure, resources, and roles and responsibilities of key contributors at each level of the health system. [19]

The PRISM conceptual framework and tools identify strengths and weaknesses of RHIS performance and associated factors. The tools can be use to design a new system, to evaluate an existing system or to evaluate the impact of interventions on RHIS. The assessment findings also aid in designing and prioritizing interventions to improve RHIS performance. Improved use of information for evidence-based decision making in turn improves the performance of health systems and leads to better health care.

PRISM is part of the Health Metrics Network Information system framework. PRISM framework and its tools reliability and validity are evaluated in Uganda. [20].

Health Metrics Network (HMN): The Health Metrics Network (HMN) is an international partnership between developing countries, international agencies, foundations, global health partnerships and technical experts that aims to strengthen health information systems. Such systems incorporate all the multiple subsystems and data sources that, taken together, contribute to generating health information: vital registration, censuses and surveys, disease surveillance and response, service statistics and health management information, financial data and resource tracking[21].

A standardized questionnaire with which country stakeholders assess the current status of the health information against specific criteria is present in the HMN tool. The tool provides a gauge of baseline status, critical gaps in health information results, processes, context and resources, and an assessment of performance and achievements.

The purpose of the HMN Framework is twofold: to target investment on the standardization of health information, and to enhance access and, by extension, usage of better health information at the national and international levels. In addition to developing the dynamic framework, the HMN has two related objectives: to deepen health information systems through providing

technical and catalytic financial support to implement the HMN Framework; and to broaden access, dissemination and usage of health information by stakeholders at all levels.

The Framework divides the components into three categories: inputs, processes and outputs.

The inputs category includes all HIS resources – the physical and structural prerequisites of an HIS. The processes used by an HIS include:• indicators • data sources • data management. The information produced – the HIS outputs – needs to be relevant, accessible, and useful evidence for decision making.[21]

On the basis of HMN tool Vital Wave Consulting HIS (2009) evaluated 19 countries HIS . out of these 19, 3 countries are selected for in-depth assessment in which one was india. The report provided insight on the present status, intended results and challenges in Indian HIS [22].

The author of Assessment of Suriname health information systems has also mentioned the HMN tools for the assessment and concluded various strengths, weaknesses , challenges and related recommendations for enhancing health information system.[23]

It would be worthwhile to discuss some of the assessment reports on Health management information system of different countries.

Country: Bhutan

As part of the second stage of Management Sciences for Health/EuroHealth Group's (MSH/EHG) technical assistance for the enhancement of Bhutan's Health Management Information System, a rapid assessment was carried out over a 4 week period from May 22 to June 15th 2000. The rapid assessment was designed and conducted by HMIS Task Force staff from the Ministry of Health and Education with technical support from a 3 person team from Management Sciences for Health.

The rapid assessment focused principally upon knowledge and practice of health workers with respect to data management (collection, processing & use), the availability and appropriateness of resources, the general organization of system procedures. It also solicited health workers' attitudes about problem areas and suggestions for improvement.

HMIS task force members and other health programme staff interpreted the collected data and came up with initial conclusions and recommendations. The assessment identified or confirmed a number of weaknesses that should become the focus of immediate HMIS improvement efforts. Recommendations were also suggested for enhancements in different areas of HIS. [25]

Country: Mongolia

The existing HMIS in Mongolia has nationwide network, well established activities and abilities to collect information comparatively rapidly but there are still problems to be solved promptly such as improvement of information quality and contents, development of active surveillance systems and development of strategic plan in accordance with the information technology progress all over the world.

To assist in the development of HMIS Strategic Plan up to 2015, HMIS international and domestic consultants made assessment of existing HMIS from August 2003 to May 2004.

In the framework of the assessment of HMIS in Mongolia especial focus made on current state of HMIS The assessment on HMIS knowledge, opinions, experiences and readiness of resources were made. Assessment team made several overall conclusions based on findings of assessment of current situation of HMIS in Mongolia.

Key messages and recommendations were also suggested to decision makers, all health organization managers and as well as information systems end users who is and will involved in the system development and implementation process of the computer.[26]

Country: Suriname

The assessment of HIS of Suriname is carried out by using the tool Health Metrics Network (HMN) . It is the primary tool of application, supplemented by other systematic approaches of evaluation.

The purpose of the assessment is to identify both strengths and weaknesses in all national health information systems to provide direction to enhance and improve such systems to optimally meet the public health and health service objectives and goals set by Ministries of Health. This assessment provided information for leaders and visionaries in the Ministry to enhance the information systems to effectively protects and services the people of Suriname.[23]

Country: India

There are several problems associated with the existing HMIS in India. In the study of Ranganayakulu, it is classified into structural, procedural, technological and human resources related issues. The available research findings suggest that HMIS in many of the African and Asian countries is very weak and suffers the same limitations as India. The evaluation of HMIS on the basis of these four dimensions suggested that in India, computerized database in HMIS is needed.[24]

METHOD

3.1 The Study:

The study will be exploratory in nature with both aspects of Qualitative and Quantitative research methodology. The data will be collected through semi-structured study tools for staff members at sub center , block and district level.

3.2 The Sample:

To understand the perception and working of HMIS at different level, multi stage sampling will be done.

Target Respondents:

The study will cover different levels of health officials and health workers like ANM (Male / Female health workers) and medical officers etc. The staff related to HMIS particularly will also be included in the study i.e. data entry operators, monitoring and evaluation officer (M&E).

Sample Size:

Total samples will be drawn from different level of public health facilities/offices(SC/PHC/CHC/DH). The total sample size will be approx 500-600.

3.3 The Tools

3.3.1 For Data collection

In order to carry out proper scientific study, semi structured tool will be developed, in consultation with major stakeholders. Review of available secondary literature such as reports, modules, documents and earlier studies on HMIS will be done before developing the final study tools.

Pre-testing of study tool: The study tools will be pre tested in the field and inputs will be incorporated in the final set of the tools. The pre testing will be done in order to assess the reliability and validity of the study tools and further development of the study tools.

Field work and data collection: After printing of the schedules, data collection will be started from all the respondents sampled at different level.

Data entry and quality checks: The data of the study will be entered using Cspro based program for minimizing the data entry error and thus provide the high quality, error free data for further analysis in SPSS. The internal consistency checks will be applied on the data for data verification. The qualitative aspects of the study will be taken care of through manual compilation of the views of the higher level officials.

3.3.2 For Data Analysis

Latest version of SPSS will be used for data analysis. The nature of the study suggests that Cross tabulations and frequency tables will be generated. Proper use of inferential statistic test will be used to verify the results.

3. POSSIBLE OUTCOMES

Maintaining a good HMIS is essential for an effective health system in any country. This study will provide an insight of health management information system prevailing at different level in Rajasthan state. Challenges and opportunities to improve the present HMIS system will be the key findings of this study. The study will also give a basis to look into the various ways to evaluate HMIS system and will provide a new framework for evaluation of HMIS considering the different aspects of rural India. To better serve the people of India, Analysis will provide a solid base to implement the recommendations and this will in turn, improve the health information system of India.

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